AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A force sensor fabricated in a micro machined process so as to have dimensions compatible with, ~~for use in for instance~~ a nanoindentation setup, ~~wherein~~ said force sensor comprising[[e]]:

– a membrane movable in relation to a bulk structure;

– at least one detection element in a detection structure in connection with said bulk structure; and

– connectors for connecting said force sensor to electronics;

wherein said membrane is attached to said bulk structure through at least one spring, ~~and that~~ said membrane includes a probe holding structure, said at least one spring provides said membrane with movement capabilities ~~for said membrane~~ in at least one direction with respect to said bulk structure; and said movement is measured using said at least one detection element.

2. (Currently Amended) The force sensor according to claim 1, wherein said detection structure includes ~~comprise~~ at least three detection elements so as to provide ; ~~providing~~ both lateral and horizontal sensitivity.

3. (Previously Presented) The force sensor according to claim 1, wherein a force acting on a probe attached to said probe holding structure is measured by detecting capacitive changes between said membrane and said detection element.

4. (Previously Presented) The force sensor according to claim 1, wherein a force acting on a probe attached to said probe holding structure is measured by detecting a piezoelectric effect in a detection element.

5. (Previously Presented) The force sensor according to claim 1, wherein said membrane has a rectangular shape as seen from a view perpendicular to a plane parallel to said detection element.

6. (Previously Presented) The force sensor according to claim 1, wherein said membrane is attached to said bulk structure with eight springs.

7. (Currently Amended) The force sensor according to claim 6, wherein said springs are located two on each side of said membrane as seen from a view perpendicular to a plane parallel to said detection element; said two springs on each side ~~are~~ located in a mirror like formation so as to provide ~~providing~~ symmetric movement.

8. (Currently Amended) The force sensor according to claim 1, wherein said at least one spring includes ~~comprise~~ a U-shaped form with heels protruding at two respective open ends ~~in order~~ so as to space said U-shaped form away from said membrane and said bulk structure.

9. (Currently Amended) The force sensor according to claim 1, wherein said probe holding structure is formed with a recessed open end relative to said bulk structure.

10. (Currently Amended) A nanoindentation system for use in a transmission electron microscope, said nanoindentation system comprising:

– a force sensor ~~comprising~~ fabricated in a micro machined process, said force sensor including:

a. a membrane movable in relation to a bulk structure;

b. at least one detection element in a detection structure in connection with said bulk structure; and

c. connectors for connecting said force sensor to electronics;

wherein said membrane is attached to said bulk structure through at least one spring, ~~and that~~ said membrane includes a probe holding structure, said at least one spring provides said membrane with movement capabilities ~~for said membrane~~ in at least one direction with respect to said bulk structure; and said movement is measured using said at least one detection element;

– a nanoindentation probe mounted on said force sensor;

– a displacement device; and

– a sample holding structure;

wherein said force sensor, nanoindentation probe, displacement device, and sample holding structure are mounted on a transmission electron microscopy (TEM) sample holder, and said sample holding structure and nanoindentation probe are movable in relation to each other.

11. (Previously Presented) The nanoindentation system according to claim 10, wherein said displacement device is an inertial motor.

12-15. (Cancelled)

16. (New) The force sensor according to claim 1, wherein said probe holding structure is integrally formed with said membrane so as to constitute a single structure.

17. (New) The nanoindentation system according to claim 10, wherein said probe holding structure is integrally formed with said membrane so as to constitute a single structure.